PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. PCT/GB2005/000984	International filing date *(day/month/year)* 15.03.2005	Priority date *(day/month/year)* 15.03.2004

International Patent Classification (IPC) or national classification and IPC
INV. G01C21/34 H04Q7/22

Applicant
TOMTOM B.V. et al.

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 3 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:
   - ☒ Box No. I Basis of the report
   - ☐ Box No. II Priority
   - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - ☐ Box No. IV Lack of unity of invention
   - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - ☐ Box No. VI Certain documents cited
   - ☒ Box No. VII Certain defects in the international application
   - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
13.01.2006	16.05.2006
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Fourrichon, P Telephone No. +49 89 2399-2579

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/GB2005/000984

Box No. I Basis of the report

1. With regard to the **language**, this report is based on

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3(a) and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4(a))
   - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been fumished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages	
1, 2, 4-18	as originally filed
3	received on 13.01.2006 with letter of 13.01.2006
Claims, Numbers	
1-15	received on 13.01.2006 with letter of 13.01.2006
Drawings, Sheets	
1/8-8/8	as originally filed

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/GB2005/000984

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-15
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-15
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-15
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Item V **Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement.**

The invention relates to a navigation device which can display travel informations, particularly in a car navigation system.

A navigation system is disclosed in document D1 = US-A-6 021 372 and other exemples of GPS based are described in pages 1 and 2 of the description. Known systems, GPS based navigation devices and other forms of embedded systems, execute all the operating system and applications code in place from a large mask ROM or XIP (execute in place) flash memory device. They all require the ROM to be burnt at an early stage in the manufacture of a product. Once the ROM mask is fixed, altering it is costly and can be complex. Hence, ROM based design are inherently not flexible and expansive.

The invention overcomes the above-mentioned drawbacks by providing a navigation device in which the operating system for the navigation device is not integral to the device, neither in a ROM nor on the hard drive, but instead on the same memory card that stores the navigation application and map data used by the navigation device. This card is not a memory device connected to the navigation device by a network, but can be inserted into and removed from the navigation device itself. This goal is achieved according to the combination of features disclosed in the independent apparatus claim (1) and of the independent method claim (9).

Claim 1 therefore is novel and involves an inventive step. The corresponding method claim and the dependent claims consequently are new and involve an inventive step.

Item VII **Certain defects in the international application**

At the regional stage, the following defects should be corrected:
Reference signs should be introduced throughout the claims.
Care should be taken to avoid, by the inadvertent addition or deletion of subject-

matter, extension of the content of the application beyond that of the application as filed.

SUMMARY OF THE INVENTION

In a first aspect, there is a navigation device, programmable with map data and a navigation application that enables a route to be planned between two user-defined places, wherein the device is operable to read a memory card that can be inserted into and removed from the device, the card storing the device operating system, the navigation application, and the map data.

The device does not store its operating system in internal ROM but instead reads if off from the memory card, which may be a SD card.

The device may further comprise XIP (eXecute In Place) Flash ROM programmed with a boot loader. On boot up, the boot loader prompts for the user to insert the supplied SD card. Once the user inserts the SD card, a card reader in the device reads the card; the device then copies a special system file from the SD card into device DRAM, the system file including the operating system and the navigation application. Once copying of the system file is complete, control will be passed to the navigation application, which starts and accesses non-volatile data from the SD card. When the device is subsequently switched off, the DRAM contents is preserved so that the boot up procedure only has to occur the first time the device is used.

This approach has a number of advantages over conventional ROM based systems:

1. Late configurability. By only 'hard coding' onto the device a boot loader in XIP Flash, the device can be configured in terms of locale and variant at a late stage in the manufacture by simply including the appropriate SD card with the finished device.
2. Cost. SD Flash memory and DRAM are the cheapest forms of memory and are cheaper than XIP Flash memory.
3. Speed. Memory access times for DRAM are much lower than those for flash memory.

CLAIMS

1. A navigation device, programmable with map data and a navigation application that enables a route to be planned between two user-defined places, wherein the device is operable to read a memory card that can be inserted into and removed from the device, the card storing the device operating system, the navigation application, and the map data.

2. The device of Claim 1 in which the device does not store its operating system in internal ROM but instead reads if off from the memory card.

3. The device of Claim 1 or 2 in which the memory card is a SD card.

4. The device of any preceding Claim further comprising internal XIP (eXecute In Place) Flash ROM programmed with a boot loader.

5. The device of Claim 4 programmed so that on boot up the boot loader prompts for the user to insert the supplied memory card.

6. The device of Claim 5 programmed so that once the user inserts the memory card, it copies a special system file from the memory card into RAM, the system file including the operating system and the navigation application.

7. The device of Claim 6 programmed so that once copying of the system file is complete, control will be passed to the navigation application, which starts and accesses non-volatile data from the memory card.

8. The device of Claim 7 programmed so that when the device is subsequently switched off, the RAM contents is preserved so that the boot up procedure only has to occur the first time the device is used.

9. A method of programming a navigation device with a map database and software that enables a route to be planned between two user-defined places, wherein the method comprises the step of: connecting the device to a memory card, the memory card storing

the device operating system, the navigation application, and the map data, and in which the card can be inserted into and removed from the device.

10. The method of Claim 9 in which the device does not store its operating system in internal ROM but instead reads if off from the memory card.

11. The method of Claim 9 or 10 in which the memory card is a SD card.

12. The method of any preceding Claim 9 - 11 in which the device comprises XIP Flash ROM programmed with a boot loader and the method comprises the step of the boot loader prompting for the user to insert the supplied memory card on boot up.

13. The method of Claim 12 in which, once the user inserts the memory card, it copies a special system file from the memory card into RAM, the system file including the operating system and the navigation application.

14. The method of Claim 13 in which, once copying of the system file is complete, control will be passed to the navigation application, which starts and accesses non-volatile data from the memory card.

15. The method of Claim 14 in which, when the device is subsequently switched off, the RAM contents is preserved so that the boot up procedure only has to occur the first time the device is used.